THE ECONOMIC IMPACT OF $1.4 BILLION OF UNIVERSITY CONSTRUCTION PROJECTS ON THE STATE OF ARIZONA

A Report from the Office of the University Economist

June 2008

Dennis Hoffman, Ph.D.
Professor, Department of Economics; Director, L. William Seidman Research Institute;
and Director, Office of the University Economist

Tom Rex, M.B.A.
Associate Director, Center for Competitiveness and Prosperity Research;
and Manager of Research Initiatives, Office of the University Economist

Center for Competitiveness and Prosperity Research
L. William Seidman Research Institute
W. P. Carey School of Business
Arizona State University
Box 874011
Tempe, Arizona 85287-4011

(480) 965-5362
FAX: (480) 965-5458
EMAIL: Dennis.Hoffman@asu.edu
wpcarey.asu.edu/research/competitiveness-prosperity-research
economist.asu.edu

ECONOMIC EFFECTS

A basic assessment of the economic effects of an investment in Arizona may be undertaken using a standard application of the program IMPLAN. Economic effects are measured in terms of three economic variables. Gross state product (GSP) is the broadest measure of the economy, consisting of employee compensation, proprietors' income, property income, and indirect business taxes. Labor income is the portion of GSP comprised of employee compensation and proprietors' income. Employment is a count of full- and part-time jobs expressed at an annual rate.

The direct effects of university construction are the incomes and jobs generated within the Arizona construction industry itself. Multiplier effects derive from interindustry transactions and the consumer spending of affected workers. Interindustry effects arise when construction firms purchase services and materials from other Arizona suppliers. Industries with significant linkages to the construction industry are architectural and engineering services, general merchandise stores, wholesale trade, building materials, and transportation services. Multiplier effects from consumer spending are felt primarily in retail trade, food services, and health care.

A summary of the results of the IMPLAN simulation appears below. Essentially the initial $1.4 billion construction investment results in an immediate addition of $828 million to GSP and $700 million in labor income after controlling for leakages in the form of resource and material acquisition from out-of-state sources. The in-state activity induces additional GSP generation of $1.1 billion and $711 million in labor income as the direct effects ripple through the Arizona economy. Most of this economic activity takes place during the time that the construction of the buildings is ongoing.

ECONOMIC ACTIVITY IN ARIZONA RESULTING FROM $1.4 BILLION OF UNIVERSITY CONSTRUCTION EXPENDITURES

	Gross State Product (In Millions)	Labor Income (In Millions)	Employment (Number of Jobs)
Direct impacts	$ 828	$ 700	14,438
Multiplier effects	1,087	711	16,660
Total impacts	1,916	1,411	31,098

COMMENTARY

The figures in the table are fair and reasonable measures of economic activity (including direct and induced activity) that will result from construction of university buildings. These estimates of economic *impacts*, however, should not be confused with net economic *benefits*. The analysis does not account for the source of financing (in-state or out-of-state), alternative options for use of public funds, or the value of the services provided by university buildings.

To interpret the economic impacts estimated in a model such as IMPLAN as net economic benefits, one must assume that the costs are borne elsewhere (for example, funding comes from outside the state) and that university construction does not simply substitute for, or crowd out, another type of construction activity. For example, if the funding source of a project in Arizona is federal funds that otherwise would not be realized in the state, these funds and the multiplier effects can be cited as an economic benefit. Similarly, investments in Arizona by private-sector companies that sell most of their goods or services to customers outside the state positively impact the state. In contrast, if a company that serves the local market constructs a new building, a net economic impact cannot be claimed since the activity is simply a redistribution of existing resources within Arizona — not a new injection from outside the state. Similarly, the use of state or local government revenues to fund construction does not result in a net economic benefit of the magnitude cited in the table since the source of funds is within the state.

If the university buildings are financed from public dollars from within Arizona, alternative uses of these dollars should be considered. The net benefits from these alternative uses can be calculated. Alternative uses of public funds include expenditures of an equal amount for other purposes, deposits into a rainy day fund, and not levying taxes in the amount of $1.4 billion. Alternative expenditures would result in economic activity roughly similar to the construction of university buildings, as would reducing the tax burdens of Arizona taxpayers. Thus, the **net** economic benefits of the construction proposal likely would be negligible once the alternative uses of the funds and the associated economic activity is considered. It is important to note that the $1.4 billion expended does generate economic activity as indicated by the Table, but it is roughly the same impact that would flow from other types of construction expenditure.

The economic impacts of a university “construction” program would be similar to the impacts of “building” a road, a primary or secondary school, or even a prison. Construction activities such as public buildings, roads and prisons are also similar because the financing costs are each borne largely by Arizona taxpayers. In contrast, the construction of a building by Boeing or Intel yields a substantial net economic impact on the Arizona economy because the funding source is external to the state and financial capital is injected into the state to pay for the new buildings. In sum, construction of university buildings is a plus for the Arizona economy but likely alternative uses of Arizona taxpayer dollars would result in positive impacts of roughly the same order of magnitude.

A Case for the Construction of University Buildings

While applying a standard economic impact analysis alone does not present a complete measure of the net benefits that accrue from allocating public monies to fund university construction, certain economic benefits will clearly flow from such construction. However, quantifying these benefits is difficult. To do so, the discussion must be shifted from a focus on the resource costs

of projects to the value of the construction projects to consumers and citizens of Arizona. Here the flow of services from the new buildings warrants consideration.

In establishing the economic benefits of the investment in university buildings, it may be useful to note the aspects of universities as institutions that distinguish them from other opportunities for government investment of taxpayer dollars. The primary channels that distinguish the economic impact from research universities from that of other government agencies are through the

- added human capital that is acquired by students who enroll at the university, and
- research and discovery activity that fosters innovation and entrepreneurship and serves as both a catalyst for existing private business and an attractor for new private investments and relocations.

In measuring the effects of these channels a linkage must be established between the new building facilities and a flow of income- or wealth-enhancing activities in Arizona that otherwise would not occur. The following is a list of arguments that support the notion that investment in university buildings yields net external benefits.

- **Research:** The investment results in new buildings that raise the reputation of ASU as a major research university. The investments attract both federal money and "star" faculty and research scientists. Empirical evidence suggests that "star" scientists are most likely to engage in relationships with the private sector that promote business development, start-ups, new patents, etc. It is the physical presence of the star scientists, rather than the embodied knowledge of their work, that is the catalyst for economic activity. (See Zucker and Darby 2007 for supporting evidence.)
- **Private-Sector Synergy:** Enhanced reputation helps attract businesses that seek to locate in proximity to major research universities — in order to tap the talents of the faculty in consulting and contract research relationships, and to hire the graduates of professional programs, lab assistants, graduate students, etc. produced by reputable research universities. This private-sector interest serves as a catalyst for private sector R&D investments as well as private support for ongoing university research. (See for example the work of Adam Jaffe and coauthors (1989, 1993 and 2002).)
- **Students:** The investment results in new buildings that attract students from out of state who come to study in Arizona, inject dollars in out-of-state tuition, and then stay within the state following graduation — in part to maintain close connections with their alma mater. The investment also helps to retain top resident Arizona students that might otherwise be enticed to study outside the state and ultimately relocate outside of the state for permanent employment.
- **Productivity:** The investment results in productivity enhancements for existing staff and faculty that enable the university to operate more efficiently — adding greater amounts of human capital per dollar spent on labor (faculty and staff) resources — than would take place in the absence of the buildings. In some cases, this efficiency may be manifested in the elimination of the need to lease space off campus.
- **Timing:** The investment takes place at a point in the business cycle when the pace of major construction initiatives is slowing and, at the same time, credit conditions are attractive. So, with the need firmly established, this is a good time to engage in the activity from a cost perspective. It also coincides with an overall slowing of the Arizona economy so the boost

provided by new demand for construction projects is welcomed by local producers.

- **Impending growth:** The investment is financed over the life of the new buildings so that a portion of the costs of the new structures is ultimately borne by individuals who have not yet moved to the state. Financing promotes intergenerational equity by matching the costs to those people who will ultimately reap the benefits over many years.

Cautions and Caveats: These arguments likely make the most sense when applied to the construction of buildings that support research, house faculty, support higher-quality instruction, or offer a more productive teaching and learning environment. Buildings such as dormitories and parking structures conceivably could be built and maintained by private concerns — and allocating public dollars to construct them may actually crowd out private-sector activities. A mix of private-public partnerships in the construction and maintenance of these structures could conceivably be an economically viable proposition.

An Example of Establishing a Value Proposition on a Building-by-Building Basis

For each of the proposed buildings it would be useful to assemble arguments that demonstrate any public investment will prove to be a catalyst for a flow of funds from outside the state that might otherwise not occur. A new business school building is one example.

A tour of university campuses across the nation reveals that significant investments in business school buildings have been undertaken over the past decade or two. (See, for example, new business buildings at UCLA, USC, UC – San Diego, Texas A&M, University of North Carolina – Chapel Hill, Ohio State University, Indiana University, University of Oregon, Penn State University, University of Virginia, and Case Western Reserve University among others.) These investments present positive images of the commitment of the university, regional businesses, and donors to the quality of business education. This image is essential to raising the national stature of the business school and allowing it to attract (a) top business faculty in a highly competitive academic market, (b) top business students from around the world who have a wide array of options — especially master's degree students who pay tuition at nationally competitive high rates (often in excess of $20,000 per year), and (c) nationally prominent businesses that invest in executive education programs and seek to establish consulting relationships with faculty.

The competition for faculty, students, and businesses is strong. Students and faculty both perceive that amenities and space available for classrooms and common areas are important indicators of program quality. Similarly, it is easy to demonstrate that the market for business school faculty is one of the most competitive academic markets today, and to be successful in this market the physical infrastructure that supports business education must portray a positive image. Any investment of public dollars in the construction of a business school building likely would be matched by donations from private donors and corporations, and/or from tuition dollars that would be generated by the investment. However, the public investment or debt authority is an essential ingredient in the overall effort.

An investment in a business school building also could be aligned with the strategic initiative underway on campus to promote entrepreneurship. Business education is an essential ingredient in promoting an entrepreneurial environment. A higher quality of business faculty and students

will increase the pool of potential entrepreneurs — especially those who can help translate inventions and technical advances into viable commercial endeavors. The number of wealth-generating entrepreneurs in a region is linked to the economic prosperity of the region.

Several units associated with the business school have been moved out of the current business building footprint so as to accommodate overcrowding. This requires that dollars be allocated to lease space in off-campus buildings. Construction of a new business building would re-establish cohesiveness across all business school units and eliminate the need for external lease payments.

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